

For the years 1868–1874 an additional correction, due to wear of the micrometer screws, is required, for particulars of which reference can be made to the Nine-Year Catalogue, 1872, in the introduction to which catalogue will be found a full and complete explanation. The results of the Greenwich observations thus corrected and reduced to one homogeneous system, when compared with the observations which Mr. Chandler has gathered together from all parts of the world, show a wonderful similarity of contour and general agreement in detail, the more remarkable when it is considered that many of the observations so collected by Mr. Chandler were made for special purposes with special instruments, with a special view to a discussion of this character. The agreement between all the curves is so good that the deviations become all the more accentuated, and, as Mr. Chandler remarks, in speculations on this subject it seems desirable to hold to a prudent reserve for further investigation. Incidentally to this investigation several other important questions have arisen, which are still under discussion.

Nova Aurigæ. By Isaac Roberts, D.Sc., F.R.S.

A photograph of the region of *Nova Aurigæ* was taken on October 3, 1892, with the 20-inch reflector, and exposure of 110 minutes, upon which the *Nova* appears as a star, as well defined as any of the other stars, which are very numerous, on the plate. There is no trace of nebulosity surrounding the *Nova*, or in its vicinity, and there is no feature about it suggestive that it is different from other stars. The diameter of its photo-image measures 21 seconds of arc, and about 85 seconds distant from it, on the *n.f.* side, is a star the photo-image of which measures 23 secs. of arc; the *Nova* is therefore 2 seconds in diameter less than the star.

On December 25, 1892, another photograph was taken of the same region, with an exposure of 20 minutes, upon which the *Nova* has a photo-image of 13 seconds of arc in diameter, and the star referred to has a diameter of 16 seconds. If we proportion the measured diameters obtained on the days stated, we shall have the following:—

$$23 : 16 :: 21 : 14\cdot63, \text{ the diameter of } Nova.$$

But the diameter of the *Nova* measures only 13 seconds, which shows a decrease of $1''\cdot63$ in diameter between October 3 and December 25.

There is no indication of nebulosity round the *Nova*, or in its vicinity, on the December plate, and it appears as sharply defined as the other stars.

So far, therefore, as the evidence obtained by the eleven

photographs which I have taken between the date of the appearance of the *Nova* and December 25, there is nothing upon them indicative of a disturbance, such as we might expect to see recorded if a body of the magnitude and velocity of the *Nova* had rushed into a nebula, or into a swarm of meteors. On the other hand, it might be argued that the great velocity of the star would carry it through without causing such great disturbance at right angles to the line of flight, according to dynamic law, that a projectile at a high velocity will penetrate through a plate of iron, or of glass, without fracturing them in the manner that a projectile would at a low velocity. On this hypothesis the inrush of the nebulous or meteoric matter, to fill the vacuum created by the star, might account for the peculiar spectra which were observed.

Photograph of the Nebula H I. 55 Pegasi. By Isaac Roberts,
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The photograph of this nebula, now presented, was taken with the 20-inch reflector on 1892 October 22, and exposure of 4 hours. The scale is 30 seconds of arc to one millimetre. R.A. $23^{\text{h}} 0^{\text{m}}$; Decl. N. $11^{\circ} 45'$, at the centre.

The nebula is No. 4892 in the General Catalogue, and is described as pretty bright, considerably large, much elongated towards 12° between two stars, irregularly round, two or three stars in it, pretty generally much brighter in the middle. It is figured in the *Phil. Trans.*, 1833, pl. 14, as a faint ray, with a faint star near each extremity.

Lord Rosse, in his "Observations of Nebulæ and Clusters," p. 170, describes the appearance of the nebula, and it is figured in the *Phil. Trans.* for 1850, pl. 36, fig. 4. The drawing shows a bright broad boundary on the following side, and on the preceding side of it a circle filled with spiral convolutions, strongly marked. A star is shown in the centre of the convolutions, but later observations, made between the years 1849 and 1876, do not with certainty confirm the spiral structure.

The photograph shows the nebula to be a faint ellipse, with a dense broad line, curved at both ends, forming the major axis. There is a star of about 15th magnitude in the centre of the axis, and there is also a fainter star in the preceding semi-ellipse, but there is no structure visible within it, such as that shown on the drawing by Lord Rosse, and it does not show the semi-ellipse on the following side, which is faintly visible on the photograph. The object is altogether a difficult one, either to see or to photograph.
